

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Steven Say-Kyoun Ow and Tae Jin Eom

Serial No.: 09/121,152 Art Unit: 1731

Filed: July 22, 1998 Examiner: Eric Hug

For: *BIOLOGICAL DE-INKING METHOD*

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Commissioner for Patents
P.O. Box 1450
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REPLY BRIEF TO EXAMINER'S ANSWER

Sir:

This Reply Brief is in response to the Examiner's Answer entered June 27, 2007.¹ A Request for Oral Hearing accompanies this Reply Brief. The Commissioner is hereby authorized to charge \$500, the fee for a Request for Oral Hearing for a small entity, to Deposit Account No. 50-3129. It is believed that no additional fee is required with this submission. However, should an additional fee be required, the Commissioner is hereby authorized to charge the fee to Deposit Account No. 50-3129.

The examiner is thanked for withdrawing the rejection of claims 27, 28 and 37 under 35 U.S.C. § 112, first paragraph (written description). As clarified by the examiner in the Examiner's Answer, the remaining rejections under review in this appeal are:

¹ This Examiner's Answer replaces the one entered on April 26, 2007. All reference to the "Examiner's Answer" is to the Examiner's Answer entered June 27, 2007. References to page numbers are to the hand written page numbers in the Examiner's Answer.

- Claims 21-25, 27, 30, 31, 33, 34, 36, 37, 40, 42-47, 49 and 50 under 35 U.S.C. § 103(a) as obvious over JP 59-9299 (JP '299)²
- Claims 26, 32, 35, and 48 under 35 U.S.C. § 103(a) as obvious over JP '299 in view of US 4,923,565 (Fuentes)
- Claims 28 and 38 under 35 U.S.C. § 103(a) as obvious over JP '299 in view of US 4,548,674 (Hageman).

It is noted that the examiner's decision to rely upon only JP'299 as evidence of obviousness in regard to claims 21-25, 27, 30, 31, 33, 34, 36, 37, 40, 42-47, 49 and 50 and rearrange the remaining rejections represents a significant departure from the evidentiary basis of the rejections as they appear in the Final Rejection of May 9, 2006 (FR). For example, in that action claims 21-27, 30, 45 and 48-50 were rejected over the combined disclosures of JP '299 and Fuentes. FR, pages 7-9. Then examiner states that this action does not amount to a new ground of rejection since it "merely places the rejections in proper form for appeal." Examiner's Answer, page 4. While that statement is subject to dispute, in the interests of expediency, appellants will respond by way of this Reply Brief. Furthermore, the Board should note that the Examiner's Answer contains the first comprehensive statement by the examiner in regard to the evidence of nonobviousness relied upon by appellants.

² The examiner omits claim 47 from this ground of rejection in summarizing the new rejections at page 6 of the Examiner's Answer. As explained in footnote 11 of the Appeal Brief, claim 47 inadvertently depends from canceled claim 41 and will be canceled in due course. Since it is pending, claim 47 is subject to rejection as set forth at page 5 of the Examiner's Answer.

ARGUMENT

Prior to responding to the new position set forth by the examiner in the Examiner's Answer it is helpful to review the legal framework in which the examiner's adverse decision of patentability should be reviewed. 35 U.S.C. § 6(b). "If examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1990) citing *In re Grabiak*, 769 F.2d 729, 733, 226 USPQ 870, 873 (Fed. Cir. 1985). Only if that burden is met is appellant required to come forth with rebuttal by way of argument or evidence. *Id.* "If rebuttal evidence of adequate weight is produced, the holding of *prima facie* obviousness, being but a legal inference from previously uncontradicted evidence, is dissipated. Regardless of whether the *prima facie* case could have been characterized as strong or weak, the examiner must consider all of the evidence anew." *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). As stated, the examiner must evaluate all of the evidence anew, both the evidence of obviousness, here solely JP '299 in regards to the first rejection under review, and the evidence of nonobviousness, here the following declarations filed under 37 CFR § 1.132:

- Kaplan I (filed with the response of Nov. 22, 2004)
- Kaplan II (filed in unexecuted form on February, 16, 2006, with an executed copy submitted on February 24, 2006)
- Eriksson
- Eveleigh I

- Eveleigh II
- Schmid.

In considering the evidence anew, the examiner should not view each piece of appellants' evidence of nonobviousness for its individual knockdown value. *Id.* As explained in detail below, this is exactly what the examiner has done in the Examiner's Answer.³ The examiner has set forth for the first time in the examination of this application, in the middle of an appeal proceeding no less, a new rationale why JP '299 by itself purportedly establishes a *prima facie* case of obviousness, followed by a discussion of the proffered evidence in a piece meal fashion. As will be established below, the examiner committed legal error by considering each piece of rebuttal evidence in isolation and never taking the required step back and evaluating the evidence as a whole. When the Board considers the evidence properly as a whole, it will be seen the weight of the evidence requires a conclusion of nonobviousness.

Rejection of claims 21-25, 27, 30, 31, 33, 34, 36, 37, 40, 42-47, 49 and 50 under 35 U.S.C. § 103(a) as obvious over JP '299

1. Separate argument for claim 21

a. JP '299 does not establish a prima facie case of obviousness

JP '299 describes a method of de-inking waste paper using a cellulase enzyme. JP '299, page 2. Any cellulase may be used but it is preferred to use "[a]lkaline cellulase...having optimum pH 8.0-11.5 (preferably 8.1-11.0). *Id.*, paragraph bridging pages 2-3. JP '299 also states that "solvent, acid, alkali etc. can be added provided it does not impair the effect of this invention." *Id.* page 4.

³ In considering the relevance of the decision in the earlier appeal, Appeal No. 92-3394, the Board should note that the evidentiary record, as well as the claim language, differs significantly in this appeal.

JP '299 exemplifies the claimed method by way of a series of experiments described in the specification and a series of comparative experiments. JP '299, Examples 1-3. In each experiment, 1.0% (relative to old paper) sodium hydroxide is used. *Id.* Howard Kaplan, an employee of Enzymatic Deinking Technologies (EDT), the licensee of the present patent application, has submitted two declarations under 37 CFR § 1.132 that compare results obtained from experiments designed to track the method of Example 2 of JP '299 and the method of claim 21 under appeal. The first Kaplan declaration (Kaplan I) was filed with the response of November 22, 2004. The second Kaplan declaration (Kaplan II) was initially submitted in unexecuted form on February, 16, 2006, with an executed copy submitted on February 24, 2006. While the Kaplan declarations will be discussed in detail *infra*, they are relevant to the present discussion as the declarations establish that pulping waste paper in the presence of 1 % by weight relative to the waste paper of NaOH results in a pH of 10.6 (Kaplan I, para. 4) or a pH of 11.19 (Kaplan II, para. 4). The examiner has not disputed these facts.

Thus, in comparing the disclosure of JP '299 with the subject matter of claim 1, it is seen that JP '299 does not describe performing the de-inking method of that reference at a pH between 3 and 8 as required by claim 21 on appeal. The examiner agrees that JP '299 and claim 21 differ in this way, stating "JP '299 does not expressly disclose that the pulping occurs at a pH between 3 and 8." Examiner's Answer, paragraph bridging pages 5-6. The examiner proposes to make up for this missing teaching from JP '299, stating "it would have been obvious to one skilled in the art to pulp the waste paper at the same pH as desired for enzyme activity." *Id.*

In support of this new conclusion, the examiner relies upon the following disclosures of JP '299:

- An especially preferred enzyme is an alkaline cellulase that has an optimum pH of 8.0-11.5 (JP '299, pages 2-3), Examiner's Answer, page 5
- Alkaline cellulase retains its activity within the acid and neutral range, *Id.*

From the facts relied upon and the conclusion reached in this portion of the new rejection, it is seen that the examiner is relying upon the disclosure of JP '299 that alkaline cellulase has "optimum" at pH 8.0-11.5 and retains activity in the acid and neutral range as suggesting that the pulping step of JP '299 be performed at a pH of 3-8. The distinction between the pH at which an enzyme shows activity and the pH at which the pulping step of JP '299 should be operated is important to keep in mind in considering the patentability of claim 21.

Other facts relevant to this issue described in JP '299 but not relied upon by the examiner in making the new rejection are:

- "solvent, acid, alkali, etc. can be added provided it does not impair the effect of the invention." JP '299, page 4, para. 3
- Measurement of the activity of the cellulase used in the examples of JP '299 was at pH 6.0, JP '299, page 5
- The examples of JP '299 were conducted in the presence of 1.0% NaOH, JP '299, pages 4, 8 and 10, which the Kaplan declarations establish results in a pH of at least 10.6 during the pulping step.

In concluding that it would have been obvious to operate the pulping step of JP '299 at a pH of 3-8 based upon the disclosure in JP '299 regarding the pH at which the

cellulase would be expected to show activity is comparing apples with oranges. Here, the examiner is relying upon pH values in regard to activity of the cellulase, not the pH to be used in the pulping step. The only embodiment described in JP '299 in regard to the pH to be used in the pulping step is found in the working examples of the reference that use 1% NaOH (pH of at least 10.6).

While JP '299 states that solvent, acid or alkali may be used, that teaching is qualified by the statement that such use cannot "impair the effect of the invention." The examiner has not relied upon this passage in making the new rejection, nor could he have properly done so without making further findings of fact as to the effect the use of, *e.g.*, acid would have on the deinking method described in JP '299. While the examiner has not done so, the record is clear as to the effect that the use of alkali has on a deinking process. For example, Dr. Eriksson states in his declaration that alkaline conditions result in swelling of the fibers which is necessary to remove ink particles. Eriksson, paras. 5-6. Dr. Eriksson's statements are supported by the Paper and Pulp Industry (PPI) article referenced in para. 6 of the declaration. PPI states that neutral deinking was first used in 1992 and is notable "since the process does not use sodium hydroxide, an efficient fiber-to-fiber friction is imperative if good ink removal is to be achieved at the pulping stage...." *Id.*, second page. Dr. Eveleigh reaches the same conclusions in his declaration. Eveleigh I, paras. 5-6. The Schmid declaration confirms that the de-inking process discussed in PPI was designed and operated to run under neutral conditions.

In addition, the second declaration by Dr. Eveleigh (Eveleigh II), supports the proposition that prior to the present invention, it was believed by persons of ordinary skill in this art that cellulases could only be used to treat cellulose fibers in conjunction with

chemical modification of the cellulose fibers. While Eveleigh II is not directed to JP '299, it is relevant to the present obviousness inquiry as Dr. Eveleigh discussed the history of using enzymes, such as cellulases, to affect cellulolysis. Dr. Eveleigh stated that the state of the art at the time of the present invention was that chemical modification and treatment of cellulose fibers was essential and necessary for efficient cellulolysis. Dr. Eveleigh stated that one of ordinary skill in the art would consider the deinking action of cellulases alone as novel and unusual.

In considering the Eriksson and Eveleigh declarations, Examiner's Answer, pages 10-11, the examiner has misapprehended the import of the declarations and thus their evidentiary value. The examiner first states that the Eriksson and Eveleigh declarations do not "present any comparison to the closest prior art." *Id.*, page 11. This is correct but has nothing to do with assigning evidentiary weight to the conclusions reached by the declarants.

The examiner next considers the opinions of the declarants that the statement in JP '299 concerning the enzyme retaining its activity "in the alkaline range as well as the acid or neutral range" refers to the conditions under which the enzyme may be purified and does not suggest the use of the enzyme for de-inking under non-alkaline conditions (Eriksson, para. 4, Eveleigh I, para. 4), stating "[i]t is considered that the retaining of the activity is a property of the enzyme itself, e.g., retained after formation and purification, it is not the conditions used to purify the enzyme." Examiner's Answer, page 11. The examiner's statement is once again unsupported. The plain language of the portion of JP '299 under discussion supports the statements of Drs. Eriksson and Eveleigh. Furthermore, the examiner has not disputed in any manner the statements by Drs.

Eriksson and Eveleigh that "one of skill in the art at the time of this invention would not have tried to *deink* at a neutral pH, or non-alkaline conditions, because it was thought that alkaline conditions were required to achieve swelling of the fibers necessary to remove the ink particles." The silence of the examiner on this point is telling.

The examiner makes four points in regard to the reliance upon PPI by Drs. Eriksson and Eveleigh. Examiner's Answer, page 11. First, the examiner observes that the claims are not limited to neutral deinking and include acid deinking and alkaline deinking (pH greater than 7.0 to less than 8.0). This statement by the examiner ignores the premise of why Drs. Eriksson and Eveleigh rely upon PPI as factual support for their opinions, that there is over twenty years of published detailed studies that emphasize chemical modification and treatment by alkali exposure is essential and necessary for deinking. The scope of the claims is not in issue here, rather, the issue is what does JP '299 suggest to the person of ordinary skill in the art in terms of the pH to be used in the pulping step. PPI is relevant since it confirms the statements by Drs. Eriksson and Eveleigh that persons of skill in the art believed at the time of the present invention that sodium hydroxide needed to be used in a deinking process to achieve good ink removal.

Second, the examiner states that PPI does not state the "technology," presumably neutral deinking, was not known earlier than July 1992. It is not clear what point the examiner intends to make by this statement. The rejection of claim 1 is based upon JP '299 alone. It is the examiner's burden to make of record and rely upon evidence as to the state of the art in making an obviousness rejection, not the authors of PPI.

Third, the examiner states that PPI indicates that the first neutral deinking system began its operation in July 1992 which is purportedly "more than a year earlier than the

effective dates of claims 26 and 35.” Again, it is not understood what is meant by this comment as the rejection of claim 21 is premised upon JP ‘299 alone.

Fourth, the examiner redounds to the assertion that the use of a cellulase having activity in the neutral and acid range is obvious from the teachings of JP ‘299. Again, the examiner confuses the pH range in which an enzyme demonstrates activity with the pH to be used in the pulping step of the deinking process of JP ‘299. The clear import of PPI is that prior to that disclosure persons of ordinary skill in the art considered the use of alkali in a deinking process to be needed.

The examiner considers the Schmid declaration stating “it fails to provide a discussion of the closest prior art, the JP ‘299 reference, and when considered with respect to the prior art and rejections applied is not persuasive to overcome prior art rejections.” Examiner's Answer, page 12. The examiner misunderstands the purpose of the Schmid declaration. As seen, the Schmid declaration provides evidence as to the knowledge of those of ordinary skill in the art at the time of the present invention. As such, it is entitled to evidentiary weight and the examiner's curt dismissal of it on the basis of issues the declaration does not address is error on the examiner's part. The examiner's dismissal of the Schmid declaration is evidence that the examiner has incorrectly evaluated the declaration for its knockdown value and has not taken the requisite step back and considered the evidence as a whole. *In re Piasecki, supra*.

Taking a step back, it is seen there is no factual support in JP ‘299 for the examiner's conclusion that “it is reasonable to expect one to pulp the paper in the presence of the enzyme at an alkaline pH which is suitable for the enzyme's activity.” Examiner's Answer, page 8. The weight of the evidence establishes that those of

ordinary skill in the art would not look to the pH at which the cellulase exhibits activity, optimal or otherwise, in determining the pH to be used *in the pulping step* of JP '299.

Rather, the person of ordinary skill in the art would look to the disclosure of JP '299 and find that the pulping step occurred at a high alkaline pH, at least 10.6, and that JP '299 *does not* state in any manner that the pH at which the cellulase enzyme shows activity is to be taken into account in determining the pH to be used in the pulping step. Dr. Eriksson and Dr. Eveleigh each state that alkaline conditions are needed in the pulping step of a deinking process to swell the fibers to effect defiberizing and deinking.

A prima facie case of obviousness can be rebutted if the applicant...can show that the art in any material respect taught away from the claimed invention. *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 533 (CCPA 1974). As stated in *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994):

A reference may be said to teach away when a person of ordinary skill, upon [examining] the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.

These legal principles apply to the facts in this case. JP '299 teaches away from using a pH in the range of 3 to 8 in the pulping step of a deinking process that also uses an enzyme. JP '299 was aware of the pH range in which the cellulases showed activity, optimal or otherwise, yet operated each pulping step at a high alkaline pH. Operation of the pulping step of JP '299 at a high alkaline pH was in accordance with the view of persons of ordinary in the art at the time of the present invention to obtain fiber swelling as stated by Dr. Eriksson and Dr. Eveleigh.

The examiner states that "if one chose to use an acid or neutral cellulase, which is within the broader teachings of JP '299, then it is reasonable to expect one to pulp the

paper in the presence of the enzyme at the same acid or neutral pH as the enzyme's activity." Examiner's Answer, page 8. The examiner cites no evidence in support of this statement and the evidence of record, Eriksson and Eveleigh, directly rebuts this unsupported assertion. JP '299 does not correlate the pH at which the cellulase is active with the pH to be used in the pulping step of the deinking process. In fact, as explained above, JP '299 teaches directly away from the examiner's assertion since the pH of the pulping step is not stated to be dependent on the pH range at which the cellulase exhibits activity.

In the Appeal Brief it was argued:

While not limiting, the examples of JP '299 provide insight into the thinking of those of ordinary skill in the art at the time the present application was filed. Despite measuring the activity of the cellulase used in the examples of the reference at a pH of 6.0, JP '299, page 5, the inventors of JP '299 performed the examples, both the inventive and comparative examples at a high alkaline pH, *i.e.*, 10-11. This fact speaks measures of the thinking of those skilled in the art at the time the present application was filed. If the enzymatic activity was measured at a pH of 6.0, why were the examples operated at a pH of 10-11? The answer to that question is provided by certain of the evidence appellants have introduced into the record.

Appeal Brief, page 14. In response the examiner states "without any information other tha[n] what is disclosed, it can only be speculated that measuring an enzyme's activity at pH 6.0 and 0.6 unit/mg solid is a standard test that does not take into account the enzyme type or operating pH. The operating pH differs because it corresponds to the choice of using an alkaline cellulase." Examiner's Answer, page 9. By the examiner's own admission, this portion of his *prima facie* case of obviousness is based upon speculation, not facts. As such, the statement is entitled to no weight and the reasonable question posed in the argument remains unanswered.

It must be kept in mind that the only evidence the examiner relies upon in making this obviousness rejection is JP '299. That reference does not suggest the subject matter of claim 21. When all of the evidence is properly considered and weighed, it is readily seen that a conclusion that JP '299 does not establish a *prima facie* case of obviousness must be reached.

b. Evidence of nonobviousness

Eriksson, Eveleigh I and II, and Schmid are discussed above in relation to the *prima facie* case and serve to undermine the examiner's stated facts and reasons in support thereof. Kaplan I and II describe the results obtained from a series of comparative tests that establish de-inking waste printed paper according to the present invention where an enzyme is used at a pH between 3 and 8 unexpectedly improves the brightness of the treated pulp (Paper L-value) and the whiteness of the filtrate (Filtrate L-value) compared with a de-inking method that uses an enzyme and 1% NaOH.

As explained by Mr. Kaplan, the results show that treatment at lower pH was more effective than the treatment at the higher pH, in the presence of 1% NaOH. Kaplan I, para. 7, Kaplan II, para. 7. The demonstrated results are relevant in the real world as the increased whiteness means that less bleach is used. Kaplan II, para. 7. In addition Mr. Kaplan states that the superior results obtained without NaOH significantly reduces the cost of the method as the operator does not incur the cost of NaOH. Kaplan I, para. 8; Kaplan II, para. 8.

In considering the results set forth in Kaplan I and II, it should be kept in mind that "[o]bviousness does not require absolute predictability of success. Indeed, for many inventions that seem quite obvious, there is no absolute predictability of success until the

invention is reduced to practice. There is always at least a possibility of unexpected results that would then provide an objective basis for showing that the invention, although apparently obvious, was in law nonobvious.” *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988). This is the case here, *i.e.*, the record evidence of non-obviousness provides an objective basis to conclude that the present invention is non-obvious.

The examiner criticizes a Kaplan declaration stated to have been filed on June 22, 2005, at pages 12-13 of the Examiner's Answer. It is assumed that the examiner is referring to Kaplan I. Regardless, the examiner nowhere in the Examiner's Answer acknowledges or discusses both Kaplan declarations. This is legal error on the examiner's part.

Turning to the examiner's criticism of presumably Kaplan I, it is seen that the examiner faults the declaration as failing “to compare the instant invention to the portion of JP ‘299 which renders the instant claims unpatentable, the portion of JP ‘299...which clearly suggests pulping of waste paper a[t] pH's [sic] between 3 and 8.” *Id.*, page 12. First, as explained above, JP'299 does not suggest deinking waste paper at a pH between 3 and 8. The only disclosure in JP ‘299 as to the pH to be used in the deinking process of that reference is the high alkaline pH used in the examples. Second, appellant can only be reasonably required to test against pH values that are disclosed in JP ‘299 to be used in the pulping stage, not what the examiner believes the reference “suggests.” Taking the examiner's position to its logical conclusion, it is seen that the examiner believes that JP ‘299 suggests claim 1 as a whole. Thus, the examiner requires appellants to test their

invention against their invention. On its face this is unreasonable and provides evidence that the examiner has committed clear factual and legal error in making this criticism.

The examiner next states that Kaplan I is not "commensurate in scope with the claimed subject matter as the only tested sample appears to be at a pH of 7.2 whereas the claims encompass a range of pHs of 3-8." *Id.* The determination of whether proffered evidence of unexpected results is commensurate in scope is a factual matter determined in a case-by-case basis. *Ex parte Winters*, 11 USPQ2d 1387, 1388 (Bd Pat App Int 1989). The examiner proffers no factual support as to why additional testing is needed. The test run at a pH 7.2 is close to the upper end of the claimed range of pH 3 to 8 and, thus, is representative of the process set forth in claim 21 compared with the examples of JP '299 that use 1% NaOH, pH of at least 10.6. The examiner does not provide any evidence that the measured increase in brightness would not be expected through out the claimed range. In any event, the examiner's criticism would go to the weight that the declaration is entitled to when *all* of the evidence is considered. The examiner's analysis again points to the piecemeal nature of his consideration of the evidence of non-obviousness.

The examiner also notes that the "tests of Kaplan show only a 0.7% difference in whiteness [and] there is no indication that this difference would provide any statistical significance and as such is actually unexpected." *Id.* This criticism points to the error on the part of the examiner in not considering Kaplan II. Kaplan II sets forth the results from further testing similar to that set forth in Kaplan I. Mr. Kaplan explains in Kaplan II the significance of the increase in whiteness values demonstrated in Kaplan I and II to result from the deinking method of claim 21. Kaplan II, para. 8. The cost savings

resulting from use of the method of claim 21 are significant (i.e., in excess of \$1 million dollars/year; *see* abstract regarding the cost of caustic soda from 1988-1991 enclosed with the declaration of Howard Kaplan) and provide evidence that the method produces unexpected results.

The examiner next criticizes Kaplan I for “alleging” that NaOH swells the fibers of the comparative fibers but does not provide data in regard to the amount of swelling obtained. *Id.* The point being made here by the examiner is not understood. The results in Kaplan I and II demonstrate the improved *whiteness* that is obtained when an enzyme is used in a deinking process *without* 1% NaOH compared with the prior art that used 1% NaOH. The precise degree of *swelling* in each sample is irrelevant in view of the demonstrated results.

The final criticism of Kaplan I that appears in the sentence bridging pages 12-13 of the Examiner's Answer and the following sentence on page 13 is not understood. There is no “general disclosure” in JP ‘299 that overlaps the pH requirement of claim 21. To use the results of Kaplan I as supporting an “expectation of success at the lowest pH disclosed by JP ‘299” amounts to using appellants’ disclosure of this technology in the application against them, *i.e.*, rampant hindsight.

c. Summary

Taking a step back and weighing the evidence of obviousness relied upon by the examiner, JP ‘299 by itself, against the evidence of non-obviousness relied upon by appellants, it is believed that the clear weight of the evidence is in favor of appellants. JP ‘299 would be read by a person of ordinary skill in the de-inking art in the context of the state of the art of this field at the time of the present invention. This means that the

person of ordinary skill in the art would have understood that de-inking according to JP '299 would take place at a high alkaline pH such as 10-11 as used in the examples of the reference, since the art considered high pH essential to fiber swelling in order to detach and remove ink particles (Eriksson, Eveleigh I). The general statement in JP '299 that acid or alkali can be used in that invention is too general to have any meaning to a person of ordinary skill in the art. The only guidance JP '299 sets forth for the use of such chemicals is in the examples where 1% NaOH is used (pH 10-11).

The examiner has committed legal error by evaluating the proffered evidence in piecemeal fashion for its knockdown effect and has not considered the totality of the evidence. Indeed it appears that the examiner has not even considered Kaplan II.

Reversal of the rejection is requested.

2. Claims 22-28, 30, 45, 48-50 are not separately argued

For the purposes of this appeal only, claims 22-28, 30, 45, 48-50 are not separately argued and stand or fall with claim 1 from which they directly or incorrectly depend.

3. Separate argument for claim 31

By way of review, claim 31 is similar to claim 21 and sets forth a method of de-inking waste printed paper comprising pulping the waste printed paper at a pH between 3 and 8 with an enzyme capable of dislodging ink particles in an aqueous medium at a pH between 3 and 8. The ink is dislodged from the waste printed paper by action of the enzyme and the dislodged ink particles are removed from the resulting pulp containing medium. Claim 31 additionally requires that the pulping occur at high waste paper consistency. The examiner believes that the disclosure of JP '299 would have rendered

the subject matter of claim 31 as a whole obvious to a person of ordinary skill in the art.

Appellants respectfully disagree.

Appellants have explained above why JP '299 does not render the subject matter of claim 21 obvious. Appellants renew and incorporate by reference herein the arguments made in regard to claim 21. In addition, the examiner's position in regard to claim 31 as expressed at page 6 of the Examiner's Answer lacks logic.

The issue of what values constitute "high wastepaper pulping consistency" is resolved by construing the claim language in light of the specification, not JP '299. It is irrelevant whether 6% consistency as used in JP '299 is considered to be "high" in regard to the invention described in JP '299. The issue is whether a 6% consistency is within the scope of claim 31. The examiner's analysis is legally incorrect.

Be that as it may, the examiner has separately rejected claims 28 and 38 which are directed to embodiments where the pulping takes place at a consistency of between 12 and 15% are rejected over the combined disclosures of JP '299 and Hageman. As set forth below, for the purposes of this appeal, appellants do not contest the examiner's conclusion that it would have been obvious to use a consistency in that range in operating the method described in JP '299. Thus, while the examiner's analysis in regard to claim 31 is in error, it appears that it is harmless error.

Rejection of claims 26, 32, 35 and 48 under 35 U.S.C. § 103(a) over JP '299 and Fuentes

Fuentes is relied upon for its disclosure of pulping fibers with a cellulase enzyme at a pH between 3 and 7. Examiner's Answer, page 6. The examiner concludes that it would have been obvious to use known acid cellulases as described in Fuentes in JP '299

at acid or neutral pH where the cellulases have the desired enzymatic activity. *Id.*, pages 6-7.

The combined disclosures of JP' 299 and Fuentes do not establish a *prima facie* case of obviousness. While Fuentes describes the use of cellulase enzyme to treat a paper pulp for defibering (i.e., breaking down the interfiber matrix), *id.*, col. 2, lines 31-53, the method of Fuentes does not involve de-inking (i.e., the detachment of inks from fibers and the subsequent removal of those inks from the fiber stock). Rather, Fuentes treats a pulp having a high SR with cellulase to lower the SR without having an undesirable effect on the mechanical strength of the paper manufactured from the pulp. *Id.*, col. 2, lines 44-47. Fuentes states that the pH of *that* process is preferably between 3 and 7 to avoid denaturing the enzymes. *Id.*, col. 3, lines 36-43. The pulp to be treated in Fuentes may contain recycled fibers. *Id.* col. 2, lines 48-53.

The last two teachings of Fuentes need to be put in proper perspective. Example 1 of Fuentes is instructive here. In this example a paper pulp that included recycled cardboard cartons was treated with sulphuric acid to adjust the pH of the suspension to 4.8. Neither the method described in Fuentes nor Example 1 of Fuentes is a de-inking method as required by the claims under review or as set forth in JP '299. Rather, the method of Fuentes can use the fibers produced by a de-inking process, *i.e.*, recycled fibers.

Thus, Fuentes and JP '299 describe two disparate, separate and distinct processes. A person of skill in the art would not look to Fuentes for insight in regard to de-inking waste paper.

If anything, Fuentes teaches away from conducting the de-inking process of JP '299 at a pH between 3 and 8. As mentioned, Fuentes prefers to operate that process at a

pH between 3 and 7 to avoid denaturing the enzyme. One can speculate that is why JP '299 measured the enzymatic activity of the cellulase used in the examples at a pH of 6.0. Regardless, the fact remains that the only specific guidance set forth in JP '299 as to the pH to be used in the pulping step of that de-inking method, the examples, tells the person of ordinary skill in the art to conduct a de-inking method at a pH of 10-11, despite having measured the activity of the cellulase at a pH of 6.0. Assuming the teachings of Fuentes in regard to its concern about denaturing the enzyme if a pH higher than between 3 and 7 is used would be viewed by a person of ordinary skill in the art as being relevant to a de-inking method, that hypothetical person would understand from reading JP '299 that enzyme denaturization is not a concern in a de-inking method since JP '299 proceeds to use cellulase in a de-inking method using a pH of 10-11.

The examiner argues that Fuentes is "cited merely to illustrate what is known in the art regarding acid cellulases." Examiner's Answer, pages 8-9. However, that knowledge must be evaluated in the context of Fuentes which is not a deinking process. Thus, the fact that Fuentes describes the use of cellulases at a particular pH in a non-deinking process does not mean that it would have been obvious to use cellulases in a deinking process where the pulping step is operated at a pH of 3-8.

To the extent that the combined disclosures of JP '299 and Fuentes may be considered to establish a *prima facie* case of obviousness, appellants rely upon the declarations of Eriksson, Eveleigh (I and II), Schmid, and Kaplan (I and II) as above in regard to claim 21. In the interests of brevity, those arguments will not be repeated here. It is believed that when the evidence of obviousness, JP '299 and Fuentes, is weighed

against the evidence of non-obviousness relied upon by appellants, the clear weight of the evidence is in favor of non-obviousness.

Rejection of claims 28 and 38 under 35 U.S.C. § 103(a) over JP '299 and Hageman

Hageman is relied upon by the examiner only to show "pulping wastepaper at consistencies of 1-15%." Examiner's Answer, page 7. For the purposes of this appeal, appellants do not dispute that it would have been obvious to use a high pulping consistency in JP '299. Rather, it is appellants' position that Hageman does not make up for the shortcomings of JP '299 and that the two references considered individually or together do not render the subject matter of claims 28 and 38 obvious for the reasons set forth above in regard to claims 21 and 31.

Conclusion

For the foregoing reasons, appellants submit that claims 21-28, 30-38, 40, and 42-46 and 48-50 are patentable.

Respectfully submitted,

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Date: August 24, 2007